① Rationalize – take root out of denominator

ⓐ $\frac{3}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{3\sqrt{2}}{\sqrt{4}} = \boxed{\frac{3\sqrt{2}}{2}}$

ⓑ $\frac{\sqrt{7}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{\sqrt{14}}{\sqrt{4}} = \boxed{\frac{\sqrt{14}}{2}}$

ⓒ $\frac{1}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}}$

$\boxed{\frac{\sqrt[3]{4}}{2}}$

② Simplify

ⓐ $\sqrt{24x^5y^6}$

$\sqrt{24} = \sqrt{4} \cdot \sqrt{6}$

$\underline{2\sqrt{6}}$

$\sqrt{x^5y^6}$

$\underline{x^2y^3\sqrt{x}}$

$\boxed{2x^2y^3\sqrt{6x}}$

1, 4, 9, 16, 25, ⋮

ⓑ $\sqrt[3]{48x^2y^8}$

$\sqrt[3]{48} = \sqrt[3]{8} \cdot \sqrt[3]{6}$

$\underline{2\sqrt[3]{6}}$

$\sqrt[3]{x^2y^8} = \underline{y^2\sqrt[3]{x^2y^2}}$

$\boxed{2y^2\sqrt[3]{6x^2y^2}}$

$\sqrt[3]{}$, 1, 8, 27, 64, ⋮

Adding / subtracting

$2x + 3x = 5x$

$2\sqrt{2} + 3\sqrt{2} = 5\sqrt{2}$

$5\sqrt{3} + 7\sqrt{3} = 12\sqrt{3}$

$4\sqrt[3]{6} + 2\sqrt[3]{6} = 6\sqrt[3]{6}$

$2\sqrt{3} + 4\sqrt{5} = \boxed{2\sqrt{3} + 4\sqrt{5}}$

$2x + 4y = 2x + 4y$

① $7\sqrt{2} - 5\sqrt{2} = 2\sqrt{2}$

② $8\sqrt{6} - 10\sqrt{6} = -2\sqrt{6}$

③ $10\sqrt{6} - 5\sqrt{3} =$ Same

Sect. 7.3
#1-10

$3\sqrt{12} + 4\sqrt{27}$

$3\sqrt{4}\cdot\sqrt{3}$ $\quad 4\sqrt{9}\cdot\sqrt{3}$

$3\cdot 2\cdot\sqrt{3}$ $\quad 4\cdot 3\sqrt{3}$

$6\sqrt{3} + 12\sqrt{3}$

$= 18\sqrt{3}$

Try

① $5\sqrt{8} + 4\sqrt{18}$

$5\sqrt{4}\cdot\sqrt{2}$ $\quad 4\cdot\sqrt{9}\cdot\sqrt{2}$

$5\cdot 2\cdot\sqrt{2}$ $\quad 4\cdot 3\sqrt{2}$

$10\sqrt{2} + 12\sqrt{2}$

$= 22\sqrt{2}$

#9

$\sqrt{18} + \sqrt{32}$

$\sqrt{9}\cdot\sqrt{2} + \sqrt{16}\cdot\sqrt{2}$

$3\sqrt{2} + 4\sqrt{2} = 7\sqrt{2}$

1
4
9
16
25
⋮

$(3+2\sqrt{5})(2+4\sqrt{5})$

	3	$+2\sqrt{5}$
2	6	$4\sqrt{5}$
$+$		
$4\sqrt{5}$	$12\sqrt{5}$	40

$46+16\sqrt{5}$

$4\sqrt{5}\cdot 2\sqrt{5}$

$8\cdot\sqrt{25}$

$8\cdot 5$

40

$$(2+3\sqrt{2})(4+2\sqrt{3})$$

	2	$+\ 3\sqrt{2}$
4	8	$12\sqrt{2}$
$+\ 2\sqrt{3}$	$4\sqrt{3}$	$6\sqrt{6}$

$$8+4\sqrt{3}+12\sqrt{2}+6\sqrt{6}$$

$\sqrt{6}$

$3\sqrt{2} \cdot 2\sqrt{3}$

6

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13-16, 21-25, 51

#16 $(\sqrt{3}+\sqrt{5})^2 = (\sqrt{3}+\sqrt{5})(\sqrt{3}+\sqrt{5})$

	$\sqrt{3}$	$+\sqrt{5}$
$\sqrt{3}$	$\sqrt{9}$ (3)	$\sqrt{15}$
$\sqrt{5}$	$\sqrt{15}$	$\sqrt{25}$ (5)

$8+2\sqrt{15}$

$1x + 1x = 2x$

$1\sqrt{15} + 1\sqrt{15} = 2\sqrt{15}$

$(2\sqrt{6}+8)(2\sqrt{6}-8) = -40$

Conjugate Pair

	$2\sqrt{6}$	$+8$
$2\sqrt{6}$	$4\sqrt{36}$ (24)	~~$16\sqrt{6}$~~
-8	~~$16\sqrt{6}$~~	-64

$= -40$

#23 Rationalize

$$\frac{4}{1+\sqrt{3}} \cdot \frac{1-\sqrt{3}}{1-\sqrt{3}} = \frac{4-4\sqrt{3}}{-2}$$

box it

Sect. 7.3

#1-10, 13-16, 21-25, 51*